

The Breast

د/ظالم صبيلا

EMBRYOLOGY:

- The breasts are skin appendages (modified sweat gland) develop from an Ectodermal ridge ^{milk line} (from ant. axillary fold to groin) & they disappear all through, except one breast for each line.

* Congenital anomalies:

(A) - The breast :- 1- Amazia (no breast) 3- Micro-mazia.
2- Polymazia (along milk line) 4- Macro-mazia.

(B) - The nipple :- 1- Athelia (no nipple)
2- polythelia (incidence 2-6%)
3- Congenital nipple retraction (usually bilateral) ^{25%}

Poland syndrome = amazia + absent pectoralis major
- common in ♂

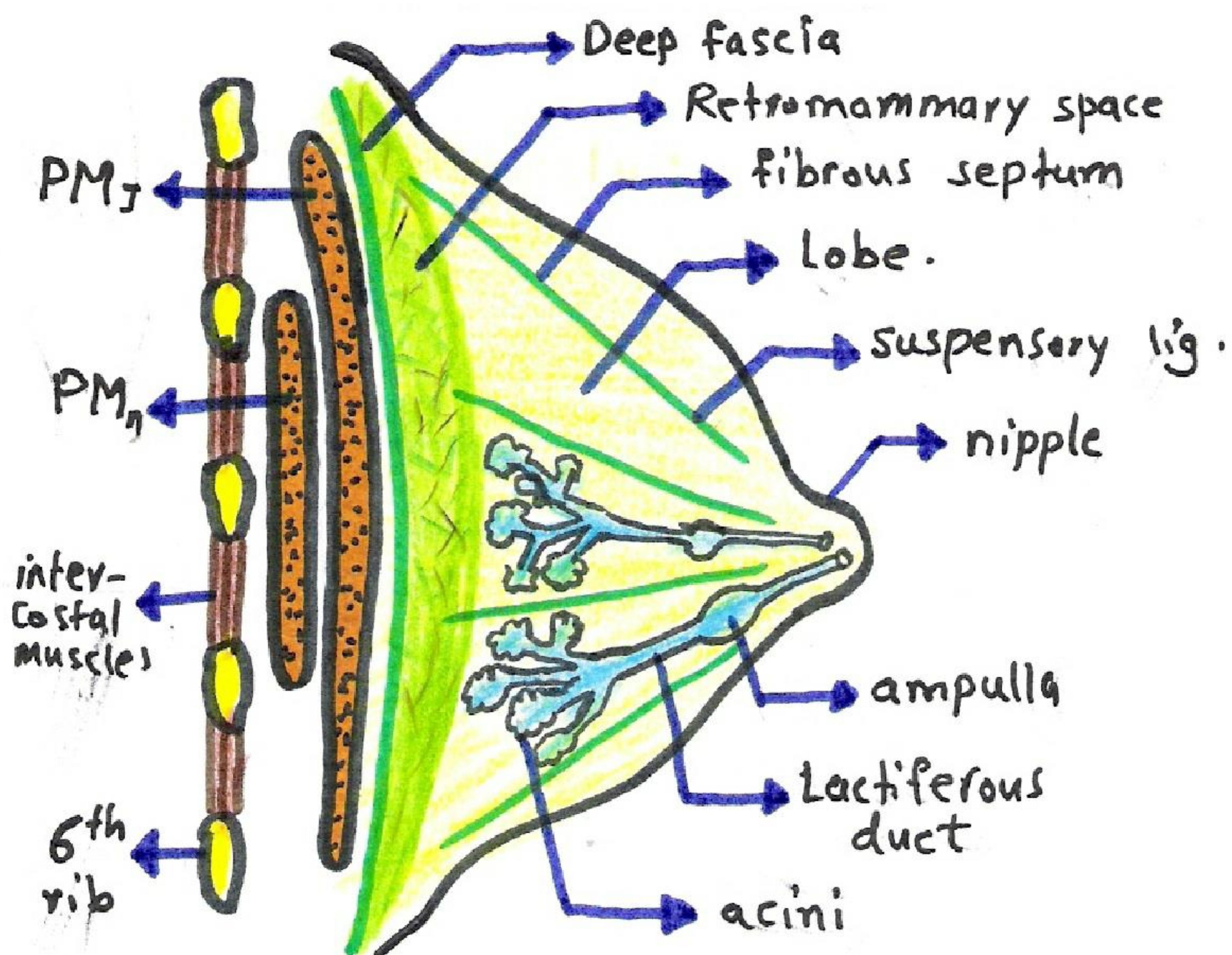
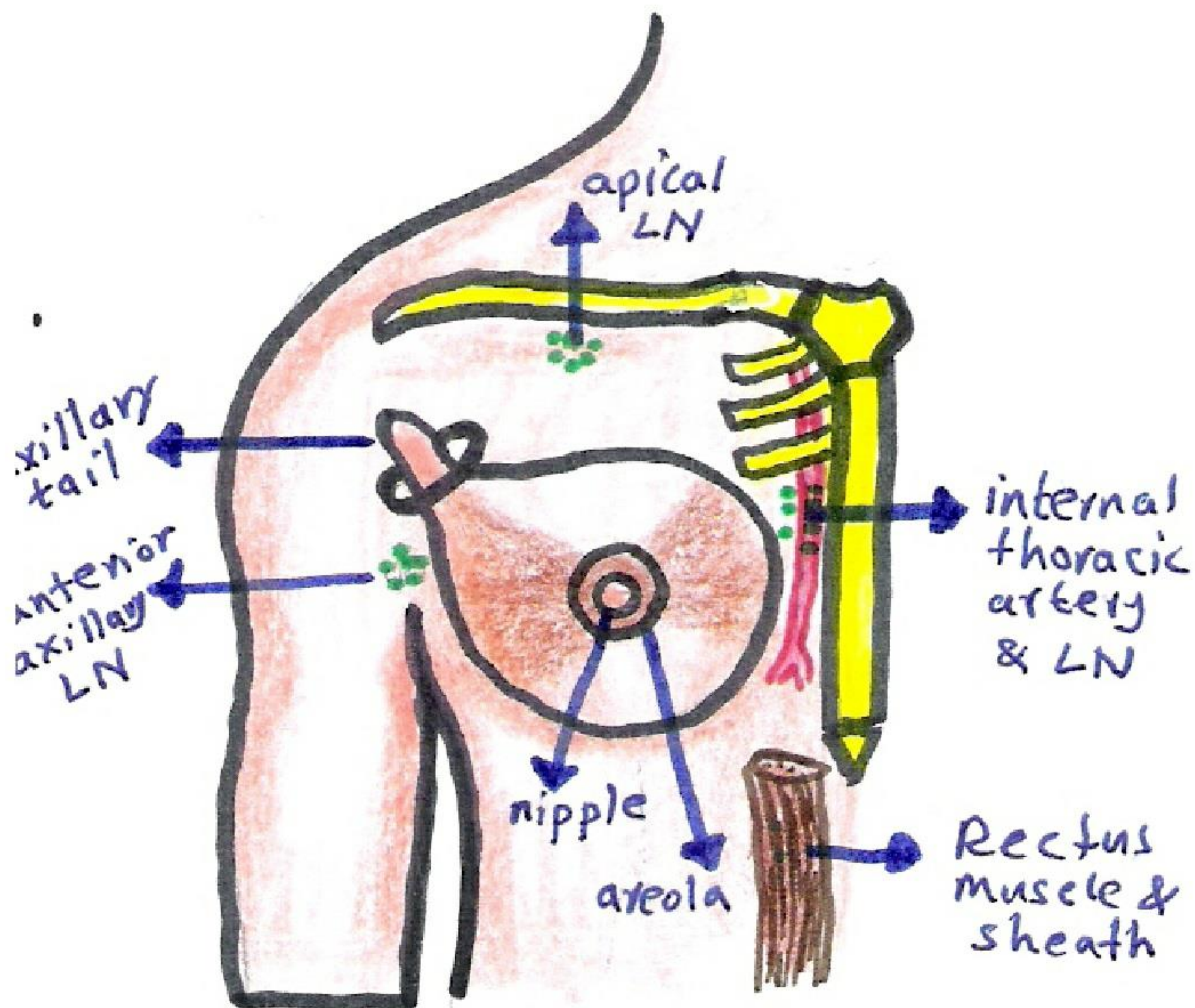
ANATOMY:

* Description:

- The breast extends from 2nd to 6th rib and from anterior axillary line to sternum (Lat. border)
- The breast presents in the superficial fascia except axillary tail which pierces deep fascia entering into axilla.
- It consists of 15-20 lobes each has an acini producing milk which transferred by ⁽¹⁵⁻²⁰⁾ lactiferous ducts to open into nipple.
- The breast skin is attached to deep fascia by fibrous bands called "Cooper's ligaments" [responsible for pind-orange in bedema, i.e. ^{skin} dimpling]
- Floor of breast formed mainly by pectoralis major with help of serratus ant. & external oblique ms.

VISIT...

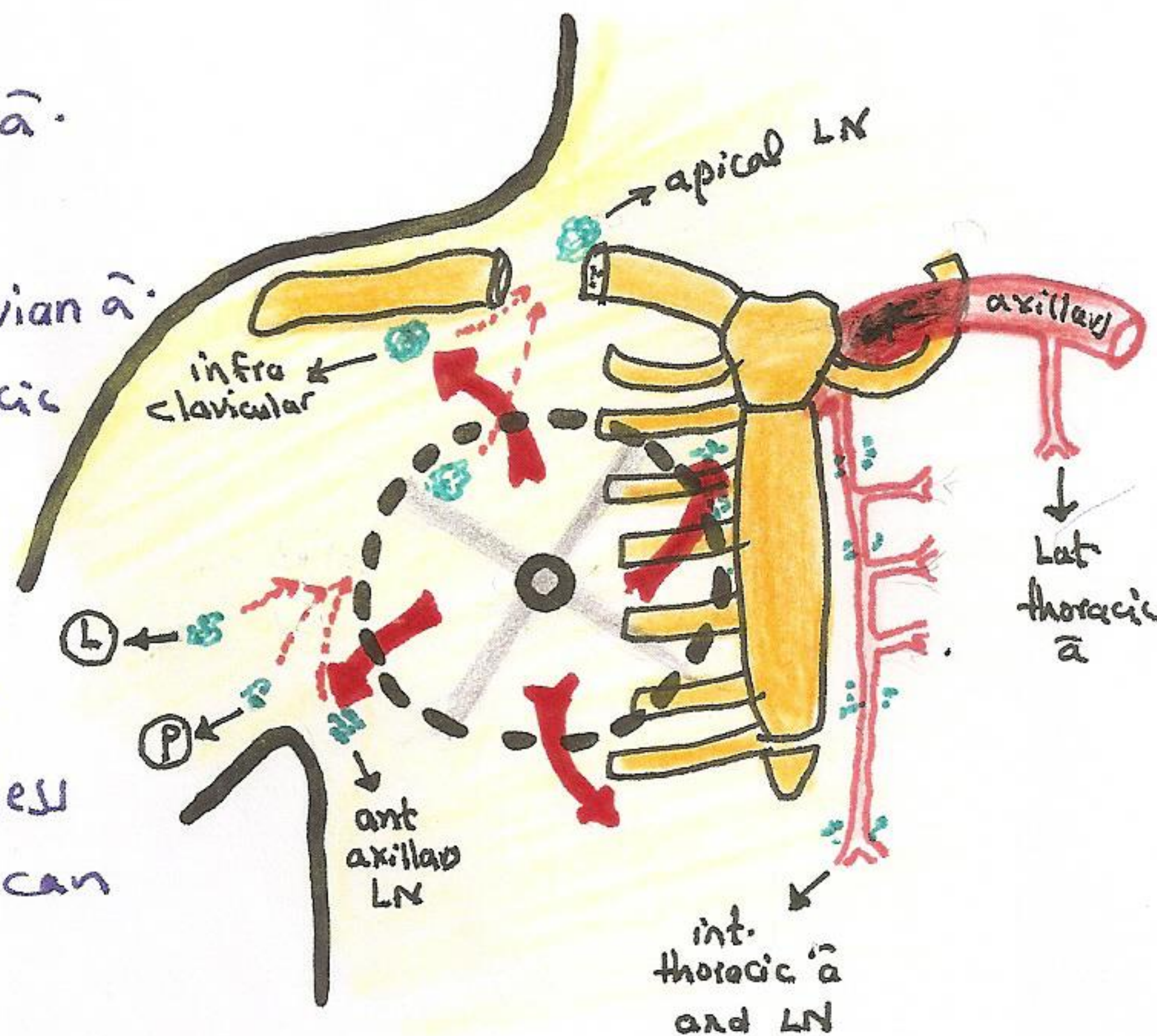
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* Blood supply :

- ① Lat. thoracic a → from axillary a.
- ② perforating branches of :
 - internal thoracic a → from subclavian a.
 - Intercostal a → from int. thoracic

* Venous drainage:- into corresponding veins, Note that intercostal veins drained into azygos vein which communicates with valveless vertebral veins [so breast ca. can spread early to vertebra].



* Lymphatic drainage:-

- ① upper quadrant:- into supraclavicular (= infracl.) LN → into apical LN.
- ② lateral quad:- into ant. axillary LN → Central → into apical LN.
- ③ Medial quad:- into internal thoracic LN: there is subareolar plexus of lymph
- ④ lower quad:- into peritoneal & abd. lymph

[NB:-] Cancer may spread to umbilicus (through falciform lig) forming Josef-sister's nodules at umbilicus.

[NB:-] The 1st LN receiving tumour spread called Sentinel LN.

- 85% of breast lymph drains into axillary LN.

- From prognostic point of view the axillary LN is

Classified by Pectoralis minor into 3 levels:

- Level I:- LN - below the ms. (≈ 4-8 LN).
- Level II:- LN - behind the ms. (≈ 10-15).
- Level III:- LN - above the ms. (≈ 30).

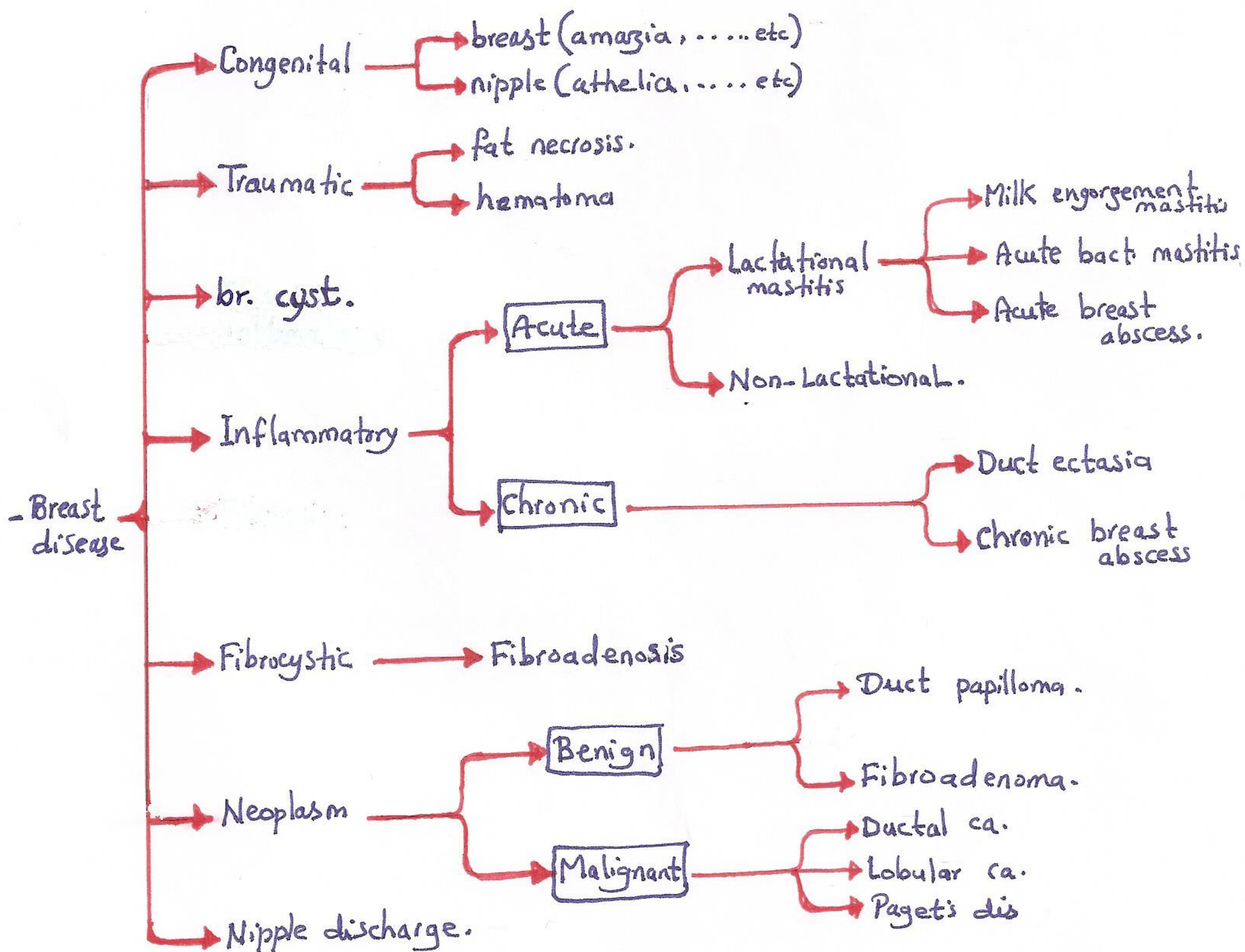
NB:- Josef-sister's nodule is more characteristic with internal malignancies as cancer stomach & pancreas.

PHYSIOLOGY ::

The breast is under effect of following hormones:

- ① Oestrogen :- causes duct elongation & branching & fat deposition
- ② Progesterone :- causes alveoli formation & prepare breast for lactation
- ③ Prolactin (from ant. pit.) :- → alveoli development for secreting milk.
- ④ Oxytocin (from post. pit.) :- → milk letdown (⊕ myo-epith. of acini).

DISEASES OF BREAST



I- CONGENITAL DIS. : Discussed before.

II- TRAUMATIC DIS

① FAT NECROSIS : (very rare) :-

- ⇒ Traumatic fat necrosis usually follows a blow → Death of some fat cells → Fatty acid [$\bar{w}$ combines $\bar{e}$ Ca^{++}] → Calcium soaps.
- ⇒ presents as a hard mass that has a characteristic chalky-white appearance at cut section. & treated by excisional biopsy.
 - may caused by indirect trauma as sudden contraction of ^{- boxing} pectoralis major _{- seat belt}.
 - + H/o trauma only in 50%

② Haematoma :

- ⇒ Usually follows a blunt trauma → blood clot → organization → Fibrosis.
- ⇒ presents as a hard mass which treated by excisional biopsy.

III- BREAST CYST

- ⇒ the cyst may develops in the stroma (interacinar) or duct (acinar).

- * **Causes :** (I)-Interacinar (stroma) cyst
- ① Traumatic (Blood cyst)
 - ② Inflammatory (acute & ch. abscess)
 - ③ Neoplastic: → degenerative cancer.
 - ④ Parasitic: → hydatid cyst.
 - ⑤ others: → skin cysts (sebaceous, lymphatic...)

- (II)-acinar (Duct) cyst →
- ① fibrocystic dis. (cyst of blood-good)
 - ② Retention cyst (e.g duct papilloma).
 - ③ Galactocele (milk cyst).

↳ simple milk cyst, usually solitary, may calcify. always date from lactation
:- aspiration

* **Treatment:**

- according to result of aspiration & cytology.
- It needs excision if
 - ① Reptid refilling.
 - ② Residual mass.
 - ③ Bloody aspirate.
 - ④ Positive cytology.

IV. INFLAMMATORY DIS.

* (A) ACUTE INFL. DIS : (I) - Acute lactational mastitis & abscess

	① Mastitis (of milk engorge)	② Acute bact. mastitis	③ Acute breast abscess
incidence	1 st month of 1 st lactation	1 st or 6 th m. of lactation	same as acute mastitis
Aetiology	Duct obstruction by : dry inspissated milk or epithelial debris.	- Staph. aureus (Gr. +ve) following : milk engor. or Cracked nipple & bad hygiene	- following acute bact. mastitis
Clinical picture.	<u>Symptoms</u> :- - Dull aching breast pain & - toxic symptoms (Fever, Headache, Malais, Anorexia) <u>Signs</u> - Diffuse Tense & Tender - No Hotness & Redness - No axillary L.N	- Dull aching pain & - toxic symp. (F.H.M.A) - Diffuse Tense & Tender - Hotness & Redness - firm tender LN	- Throbbing pain > night - toxic symp. (F.H.M.A) & fever is Hectic (ie fluctuant) - Diffuse tense & tender - Hotness & Redness. - firm tender LN. - Purulent discharge - Pitting oedema. - Fluctuation (v. late)
- Fate:	- Acute bact. mastitis (if neglected).	- Acute breast abscess (if neglected)	- toxemia & Septicemia if not drained - antibioma if Rxed only by AB

* **NB** - Acute bacterial mastitis may be misdiagnosed with Mastitis Carcinomatosa which has gradual slow onset & involving more than $\frac{1}{3}$ of breast & not responding to antibiotics.
 - Acute bact. mastitis has firm tender LN. while Mastitis Carcinomatosa has hard non tender LN.

* **NB** - Breast abscess may be divided into

- ① Supra (pre) mammary :- under skin
- ② intra - mammary :- inside breast
- ③ Retro (post) mammary :- bet. breast & chest wall.

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* Treatment of acute lactational mastitis:

(A) Prophylactic: ① Good hygien of breast during lactation.

- ② If nipple cracked → stop lactation
→ Wash & boric lotion.
→ Antibiotic.

(B) Treatment :- ① Before abscess formation:-

- Local heat application & support breast by braces.
- Antibiotic against staph. (Flucloxacillin or cephalosporin)
- Stop feeding according to baby age:-
 - if > 9m. → stop feeding by Parlodel 2.5mg/12hr
 - if < 9m → Continue feeding by healthy breast & regular pump evacuation of diseased.

② Abscess formation:-

- Incision & drainage (under general anaesthesia).
some advice don't to stop feeding even pt taking antibi

Incision:- depends on type of abscess:-

- ① Supra-mammary → incision any where above abscess.
- ② Retro-mammary → incision in sub-mammary fold.
- ③ Intra-mammary → Can be:-
 - a) Radial:- radiating from areola. 
 - b) Circum-areolar:- at margin of areola then radial incision at breast tissue (cosmetic) 
 - c) Counter incision:- at opposite site for first incision (dependent area) 

(II) Acute non-lactating mastitis:

- ① Infected haematoma or tumour.
- ② Local irritation e.g ill fitting braces (Traumatic mastitis).
- ③ Mastitis of mumps.
- ④ Mastitis Neonatorum:- Swollen breast 3rd or 4th day with few drops "Witch's milk" due to maternal prolactine, it subside 2-3 weeks.
- ⑤ Mastitis of puberty (Male only):- swollen painful (suppuration ^{Never} occur) in adolescend boy, subside 2-3 week.

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* ⑧ CHRONIC INFL. DISEASE :

	① Mammary Duct ectasia (plasma cell mastitis)	② Chronic breast abscess
Definition	- Dilation of major breast ducts	- Chronic pyogenic (non specific) or specific (TB, ϕ) infection.
Cause:-	- unknown - common in smoker's women	- improper ttt of acute abscess or ch. infection by TB, ϕ .
Pathology	- chronic infection of duct $\rightarrow$ dilatation filled by: Creamy secretions (atrophic epithelium + Fatty material) surrounded by: plasma cells (so called Plasma cell mastitis)	- Cavity containing pus with thick fibrous wall - Prolonged use of antibiotic $\rightarrow$ killing of bacteria $\rightarrow$ sterile pus called "Antibioma"
c/p	- around or after menopause. - Hard mass $\pm$ nipple retraction & peau d'orange (as cancer breast) - <u>Green paste discharge</u> (but can be any colour)	- H/o acute abscess - Hard mass $\pm$ nipple retraction & peau d'orange (as cancer breast) - S/s of chronic disease (TB, ϕ) if they are the cause.
Treatment	Excision & biopsy (to exclude malignancy) antibiotic (Flucloxacillin $\pm$ Flayl)	Excision & biopsy (to exclude malignancy)

duct ectasia can present $\pm$ worm-like swelling extend radially from nipple.

milk fistula:- due to abscess
ttt fistulectomy

NB: Mondor's disease:

- It is a superficial thrombophlebitis of sup. veins of breast the pathognomic feature for it is a thrombosed (cord like) subcutaneous veins.
- Treated by rest of arm (restrict movement) & usually it is a self limiting condition. (within few months).

NB: Tietze disease: (rare)

- It is a costochondritis, idiopathic swelling in 2nd & 3rd costal cartilage presented by tender swelling mistaken for breast mass, treated by hydrocortison into perichondrium in severe cases.

V. FIBROCYSTIC DIS. OF BREAST: ANDI

(Benign breast changes)

* **Other names** :- Fibroadenosis, Mammary dysplasia, mastopathy & ANDI (Aberration of Normal Development & Involution)

* **Incidence** :- Commonest breast disorder ^{>40 yrs}, Commonest site upper Lat. 1/4.

* **Aetiology** :- Unknown [may be due to oversensitivity of oestrogen receptors].

* **Pathology** :- Macroscopic (N/E) :- Localized or diffuse, unilateral or bilateral.

Microscopic :- Panplasia :-

- Adenosis :- ↑ No. of acini
- Epitheliosis :- ↑ No. of duct epithelium → Atypical hyperplasia
↳ precancerous (fibroadenoma or duct papilloma)
- Fibrosis :- ↑ Fibrous tissue replacing fat & elastic tissue
Causing Sclerosing adenosis
- Cyst formation :- Degenerating or Retention cyst.
- retention cyst (Cyst of Bloodgood) is due to epitheliosis or fibrosis.

NB :- Duct papilloma = Localized epitheliosis while
- fibroadenoma = adenosis + fibrosis (Localized form)

* **Clinical picture** :- [May be asymptomatic]

• Age :- after puberty or before menopause.

↗ pregnancy usually relief pain.

• Symptoms :- Pain :- Dull aching ↑ before & ↓ after menses.

- Discharge :- Serous, Green or Dark brown in colour.

- Mass :- Painful & Fixed to breast tissue.

• Signs :- • Breast :- Tender firm mass (or fine nodules by finger tip)

- Discharge by patient her self.

- Mass away from areola [D/D from Duct papilloma]

• LN :- axillary LN firm & tender [Never hard].

* **Investigation** :- u/s - soft tissue mamography, Aspiration & cytology & biopsy.

* **Treatment** :- ① - reassure pt & advice to stop caffeine, NSAID, sedatives & support breast

② - Parlodel (antiprolactine) 2.5 mg twice daily

③ - Tamoxifen (antioestrogen) 10 mg once daily ~~relieve pain~~

④ - follow up in Atypical hyperplasia (monthly self exam.)

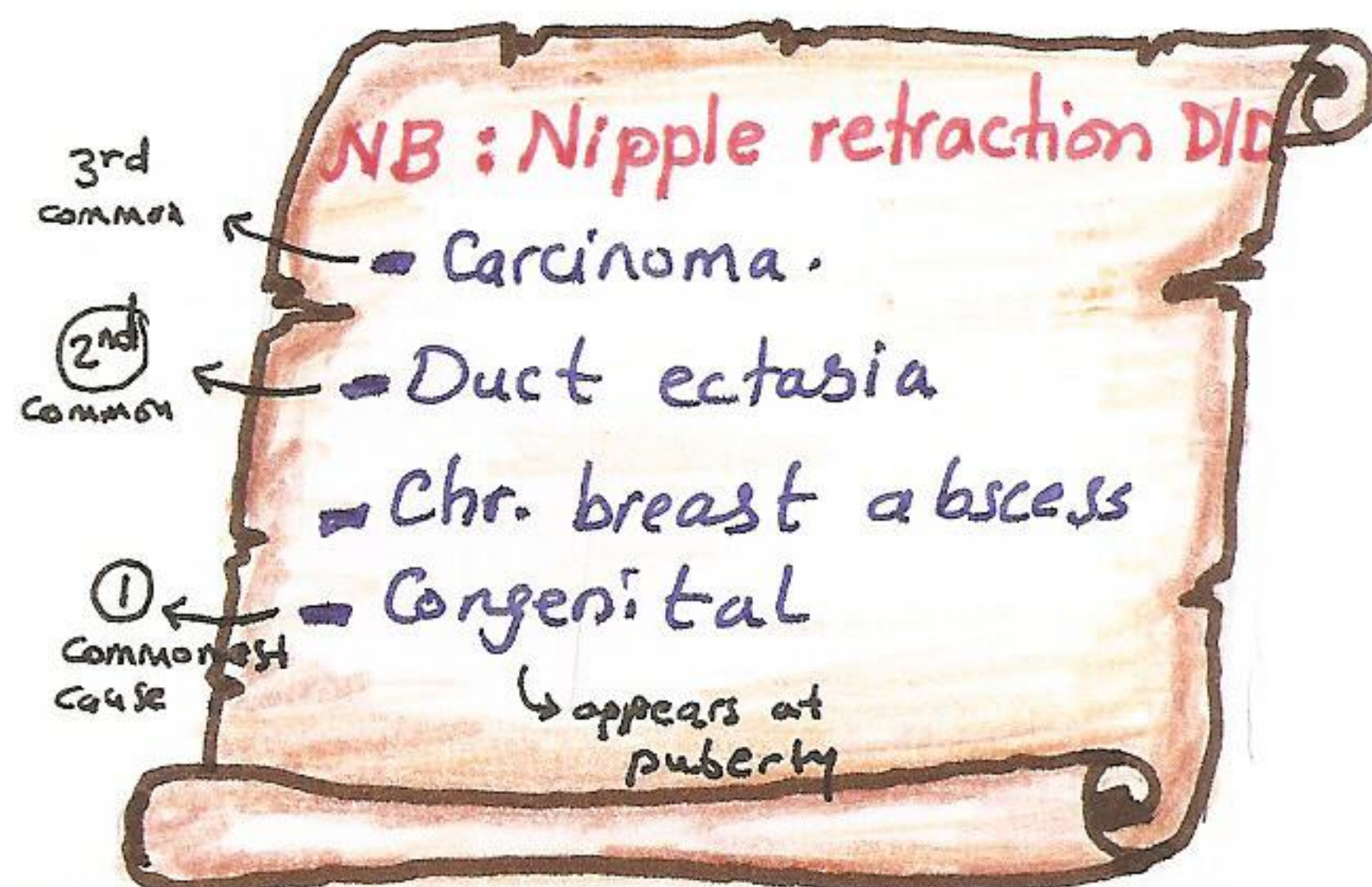
⑤ - Surgery (excisional biopsy) if localized mass.

VI - NIPPLE DISCHARGE

* Causes :

(A) physiological :- milky : Lactation .
 - Serous : pregnancy .

(B) Pathological :- milky → Galactorele , hyperprolactinemia .
 - Serous, green, brown → Fibroadenosis
 - Bloody → Duct papilloma & Duct carcinoma & duct ectasia
 - Green paste → Duct ectasia.
 - Purulent → Acute breast abscess.
 - Necrotic crystals → Degenerative carcinoma.



* Diagnosis & investigation :-

- History & examination.
- Mammography (soft tissue mamm.)
- Ductography [Lipiodol injection → filling defect].
- Biopsy & Cytology → for mass.
- U/S → for cystic lesions.

[NB: Nipple discharge is the 3rd most common breast complaint after lumps & breast pain]

* Treatment :

- For Mass → Excision & biopsy.
- If no Mass :-
 - Localized duct → Microdochectomy.
 - Many ducts (rare) → Cone excision of major ducts (for >40yrs)

D/D of breast mass

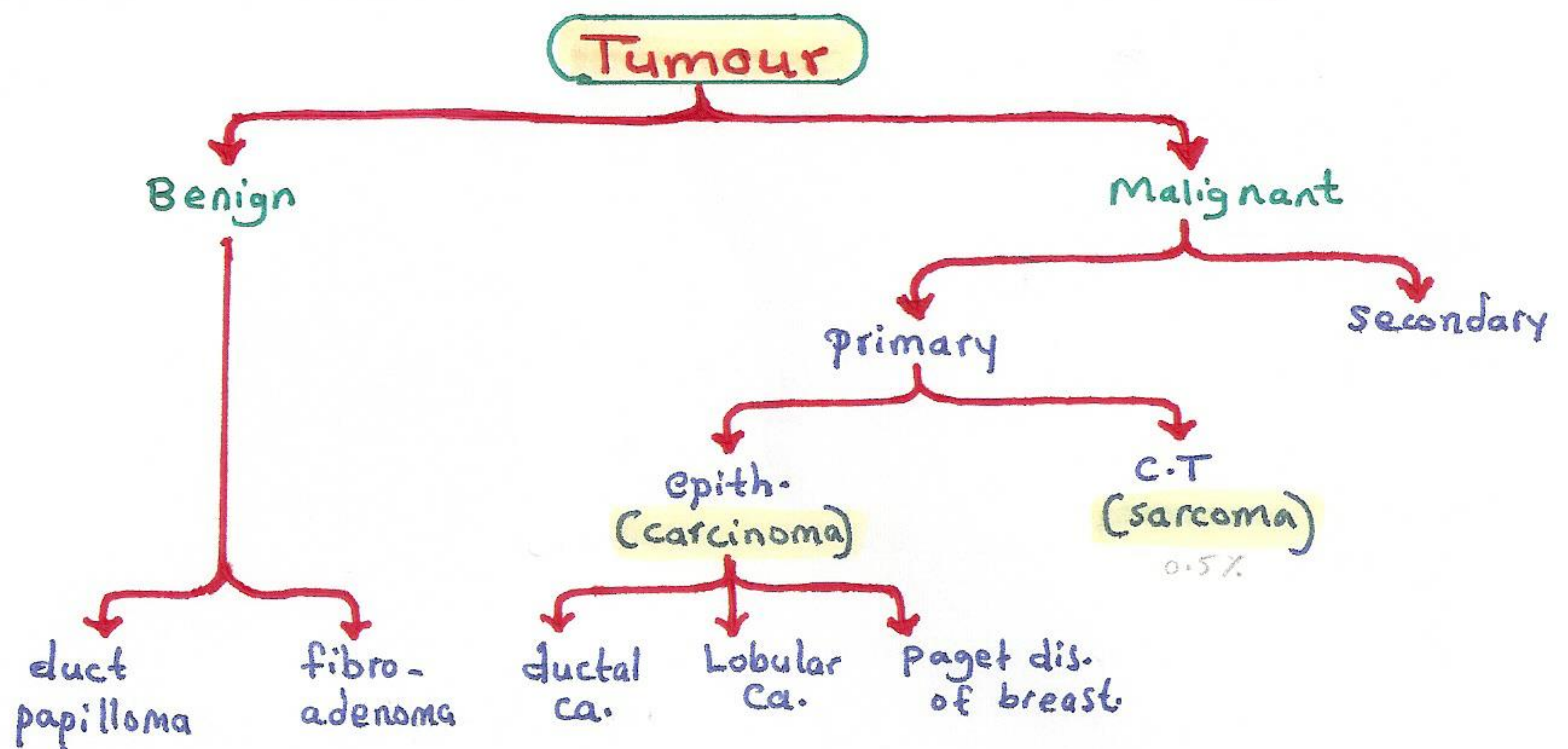
- ① cystic swelling → see breast cyst.
- ② Solid swelling :-
 - Firm mass → Fibroadenosis.
 - Soft mass → Soft fibroadenoma
 ▶ breast ca. (encephaloid & Mucinous).
 - Hard mass → hard fibroadenoma.
 ▶ breast ca. (Scirrhus & atrophic scirrhus)
 ▶ Traumatic.
 ▶ Duct ectasia
 ▶ Ch. breast abscess

D/D of Pain in breast

- ① inside breast :
 - Fibroadenosis
 - acute inflamm. diseases (i.e. its types)
 - Cancer (advanced or infected)
- ② outside breast :
 - Angina
 - Myositis
 - Tietze dis.
 - intercostal neuralgia.
 - pleurisy
 - rib ostitis

VII - NEOPLASM :-

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A * BENIGN TUMOUR

1- Duct Papilloma :- (intraductal Papilloma)

- Incidence :- common at 30-40 yrs.
 - Commonest cause of bleeding per nipple.
- Aetiology :- arise De Novo or on top of epitheliosis (ANDI)
 - it is a tumour of epithelial cells.
- Pathology :- **N/E** :- single pedunculated mass from main lactiferous duct (near nipple).
 - Micros.** :- vascular C.T core covered by epithelial layer.
- C/Picture : ① commonest c/p is bleeding nipple discharge in 50% of pt. (may be serosanguinous) No pain
 - ② swelling → retention cyst → retroareolar
- Investigation :- **Ductography** (Galactography) → filling defect
 - Benzidine test for blood, ^{u/s} mammography (screening)
- Treatment :- **Microdochectomy** :- (remove duct) & histopathology
 - [if there is mass excision easy, if not insert blind needle into discharging nipple intraop.]
- Complication :- premalignant (10%) → duct carcinoma.
 - profuse bleeding.

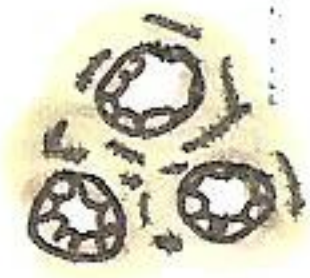


Ductoscopy & biopsy can be used in Dx.

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2. Fibroadenoma

(15-30y)

- Incidence :- most common benign in women < 30 years
 - Never change into malignancy (risk of malignancy only if complex fibroadenoma or strong family history of breast cancer. "Toronto Note")
- Aetiology :- arise De Novo or on top of adenosis & fibrosis of ANDI.
 - It tumour of epith- & mesenchymal.
- Pathology: **N/E** :- well capsulated, pedunculated. 
 - Micro**:- ducts are surrounded by fibrous tissue
- C/picture:- usually ^{Nodule} small, non tender, firm, well-circumscribed with smooth surface & with high mobility (Breast mouse), no LN. "hormon dependent"
"Painless lump discovered accidentally"
- Investigation:- U/S (< 35 years), mammography.
 - Core or excisional biopsy required. "Toronto"
- Treatment:- generally conservative; serial observation
 - excision & biopsy if size 2-3 cm & growing on serial u/s, if symptomatic or pt preference. Toronto
- NB:- 10-15% are multiple, if > 5 cm called Giant fibroadenoma.

* Cystosarcoma phyllodes :-

(Sero-cystic disease of Brodie) :-

- It is a giant soft ^{intracanalicular} fibroadenoma, seen in late 20^s. ^{>40} (USMLE)
- most are benign (but have potential ^{rare} to become malignant sarcoma.
- core or incisional biopsy is needed (FNAC not sufficient)
- ~~the~~ is simple mastectomy (no LN).

* Papillary cystadenoma :-

- rare precancerous lesion, considered type of duct Papilloma with cystic but firm consistency.
- ~~the~~ by local excision

① SARCOMA :-

- * Incidence :- - very rare , represents $\approx 0.5\%$ of the malignant breast tumour.
- * Aetiology :- - arise De Novo or rarely following cystosarcoma phylloides.
- * C/picture :- fleshy rapidly growing (bulky) & usually fungating through skin. , 30-40 yrs.
 - metastasis by blood (rarely LN).
- * Treatment :- - Palliative ^{simple} mastectomy (as $\nexists$ no LN).
 - Radiotherapy.
- * Prognosis :- - very bad prognosis

② CANCER BREAST :-

- ### * Incidence :-

Commonest cancer in female.

- the 2nd leading cause of death in women (after lung).
- about 1 out of 12 women in UK develop cancer breast

- ### * Aetiology

*** Aetiology** :- risk factors represent only 25% of ca. breast.

A - Major risk factors :-

- 1- Age :- Peak 60-70 yrs [rare <20, affect 20% of >90y]
- 2- Sex :- 99 times more in ♀ than ♂ (99%♀)
- 3- Family history :-
 - 1st degree relative ↑ risk x2 folds,
 - if two 1st degree ↑ risk x4 " "
 - if bilateral in 1st degree ↑ risk x6 " "
 - younger age pt more chance for her family.

(20% of ca. breast are familial).

(20% bilateral)

- if mother & sister ↑ risk x 14 folds

4- Genetic:- (5-10% of ca breast are due to mutation in suppressor genes:

- BRCA I (on ch. 17): associate w ovarian ca.
- BRCA II (on ch. 13): " " male breast ca.
- P53 gene mutation $\rightarrow$ produce **Li Fraumeni synd.**
(Breast ca, ovarian ca, colon ca, lymphoma or leukemia)

5- Nulliparity.

6- Precancerous lesion as - duct papilloma. (multiple $\uparrow$ 2x)
- ANDI is a typical hyperp. ($\uparrow$ 5x)

7- previous contralateral br. ca. :- especially with lobular carcinoma.

B- Moderate risk factors :-

1. Endocrinal :-
 - Early menarche (<12 yr).
 - late menopause (>50 y).
 - (cholesterol $\rightarrow$ Estradiol $\rightarrow$ $\uparrow$ estrogen).
 - late 1st pregnancy (>30 y).
 - Non-lactating women.
- 2- radiation to breast .. before age of (30). $\uparrow$ risk of cancer breast

C- Minor risk factors :-

- 1 - Diet ; intake of mammalian oil (beef & pork) $\uparrow$ risk
2. Oral cont. pills (for long time & if before 1st preg.) and hormonal replacement therapy. (HRT) $\rightarrow$ controversial
3. physical inactivity.

NB:- Ca breast more in western country & less in Japanese.
- " " $\uparrow$ in pt w H/o Ca colon & endometriosis

- usually cancer appears earlier than her 1st degree relatives by 10 years.
- Alcohol & smoking has no effect with cancer breast.
- obesity in postmenopause $\uparrow$ risk & in premenopause $\downarrow$ risk.

* Pathology :-

invasive Ca

- special type :- fixed morph. picture & biological behavior better type
- Non special type (NST) = not otherwise specified (NOS) not fixed morph. & biology.

A. Macro/Micro Picture :-

- Most common at upper lat. quadrant 60%

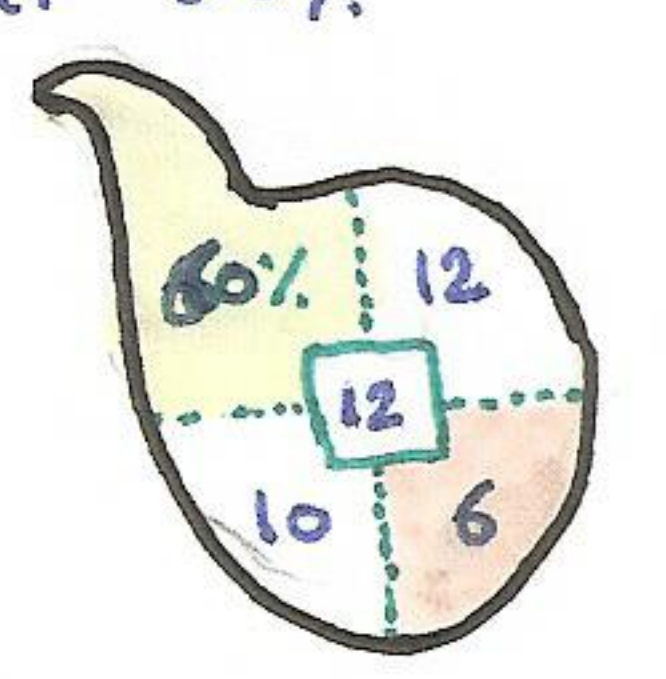
* classified according to origin into:-

① Lobular Ca:- (10%)

- LCIS : (Lobular Ca. in situ):-

pre can., mammographic finding.

- ~~LCIS~~ invasive Lobular Ca.:-

multifocal & may be bilateral in 25%  mirror image

② Ductal Ca:- (90%)

- DCIS (ductal Ca in situ):-

(in situ ie doesn't invade basement memb.)

- invasive ductal Ca:-

* classified according to histology into

- the invasive ductal Ca divided into:

	Scirrhus	atrophic scirrhus (Tubular)	Encephaloid (medullary)	Colloid (Mucinous)	inflammatory
N/E	Commonest small hard irregular mass	very slow v. late spread	large, soft irreg. mass	Bulky & soft gel like subst	large soft v. rapid growth anaplastic
Micro	Fibrous > cells	Fibrous > cells (malign. very few)	Malign. cell > fib Hge & necrosis	spherical cells & mucin "signet ring"	as acute mastitis
prognosis	good prognosis in early	v. good	better than scirrhus	Best Honey comb appearance	worst

B. Grading :-

Grade I :- (well differentiated) (3-5)

Grade II :- (moderate ") (5-7)

Grade III (poorly ") (7-9)

Gland formation hyperpl. 1, 2, 3
Nuclear polymorphism 1-2-3
mitosis frequency 1-2-3

NB:- Grade I better prognosis than Grade III

NB:- DCIS change to invasive DC by 30-50% in 10 years
LCIS " " " DC " 15% but LCIS considered
not premalignant but risk factor

* Comedo Ca. :-

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- central necrosis of cancer with paste like material from cut surface.

* Paget disease of the Nipple :-

- It is ductal carcinoma that invades nipple with scaling, eczematoid lesion.
- the nipple eroded & disappears followed by cancer that becomes clinically evident
- incidence 1% female > 40 y.
- C/P :- unilateral erosion nipple, no itching, no oozing malignant eczema

NR :- Eczema of dermatitis differs in that :- itching, oozing, bilateral commonly & respond to treatment, young female, no underlying pathology

- **invest** :- triple assessment → clinical.
→ radiological
→ biopsy
- **ttt** :- simple mastectomy (if no LN) → good prognosis
- **Pathology** :- Paget cells (large, dark multinuclei, vacuolated → hydropic change).

C Staging :-

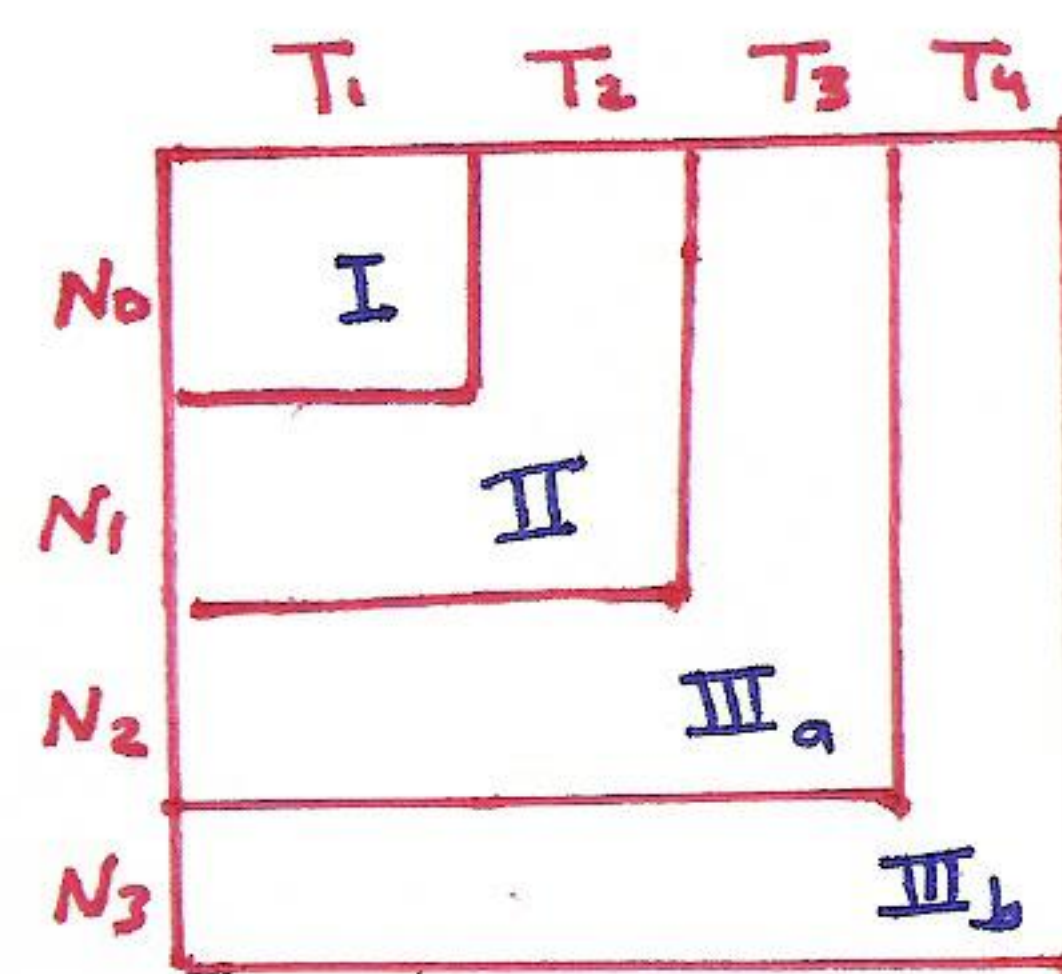
① Manchester classification :-

- Stage I :- mobile mass, no LN, no metastasis
- Stage II :- mobile mass, mobile LN (ipsilat), no metas.
- Stage III :- fixed to skin, fixed LN (± supracl. LN), no met.
- Stage IV :- fixed to chest wall, contralat. LN, metastasis

② TNM staging :-

T = Tumour	N = Node	M = Metastasis
Tis = Ca in situ or paget eout mass	N0 = No LN palpable	M0 = no metast
T0 = no evidence of primary	N1 = mobile ipsilat	M1 = distant met.
T1 < 2 cm	N2 = Fixed "	[including ipsilat supraclav]
T2 2-5 cm	N3 = internal thoracic LN.	
T3 > 5 cm		
T4 = skin invasion (fixed) or chest wall		

- Stage Tis (in situ) $\rightarrow$ Tis, No, Mo
- Stage I $\rightarrow$ T₁, No, Mo
- Stage II $\rightarrow$ T₁, N₁, Mo
T₂, No/N₁, Mo
- Stage IIIa $\rightarrow$ T₁₋₃, N₂, Mo
T₃, No-2, Mo
- Stage IIIb $\rightarrow$ any T, N₃, Mo
T₄, any N, Mo
- Stage IV $\rightarrow$ any T, any N, M₁



NB: Grading is a histopathological study
Staging is a clinical study (exam, invest.)

D - Spread :-

1. Local :- to skin & underlying structures & chest wall (Pectoralis)
2. Lymphatic :- (by permeation or embolization) into axillary LN mainly (75%) $\xrightarrow{\text{may}}$ lymphoedema of upper limb, or supraclavicular or internal thoracic LN.
3. Blood :- to liver, lung, Brain & Bone (LLBB) but mainly to thoracic vertebrae [due to presence of valveless veins between vertebrae & azygos system that drains the intercostal veins].

NB :- tumour & TB can spread retrograde from LN to the breast

* predisposing factors for ca. breast male

- 1- gynecomastia
- 2- testosterone ing. in athletes (test. atrophy)
- 3- ↑ androgens or exogenous oestrogens

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Breast clinic

Radio therapist
surgeon
oncologist
Nurse

* Clinical Picture :-

A. Local :- ① Breast lump :- (80-90% of case)

hard, painless, rapidly growing in upper lateral quadrant mostly discovered accidentally or at screening.

② Breast pain :- mostly non-cyclic mastalgia
↳ only in 10% (non periodic pain).

③ Nipple discharge :- Blood-stained, but mostly watery (send for cytology).

- Skin manifestation of cancer breast :-

- Dimpling → due to contraction of Cooper's lig
- Pseudorange (pitting oedema) → lymph obst
- nipple retraction by fibrosis
- ulceration & fungation (raised everted)
- Paget dis (eczema).
- Cancer en cuirasse (war shield) → hard thick skin (metastasis)
- Mastitis carcinomatosa.
- Satellite nodule in skin.
- Puckering & tethering of skin

- 1st presentation may be at screening

B. General :- presentation of metastasis can be ext breast manif.

- Bone :- Backache, pathological fr.
- Brain :- (v. rare) : ↑ ICP symptoms
- Lung :- Chest pain, cough, Dyspnea, hemoptysis.
- Liver :- Rt hypoch. pain & jaundice

NB :- D/D of massive swelling of breast are

- cystosarcoma phylloides
- diffuse hyperplasia.
- sarcoma.
- Giant fibroadenoma
- colloid (mucinous) carcinoma
- filarial elephantiasis.

NB: the early sign of cancer breast is a prickling sensation in a breast lump / Dimpling may be benign.

* Diagnosis

:-

by triple assessment

- clinical (History & exam)
- imaging (US, MRI, mamog.)
- pathology (FNAs, biopsy).

- detailed family history, self examination

Dx 60% of cases.

① Soft tissue mammography :- (95% accurate) [→ low voltage, high amperage]

- done for pt > 35 yr [not done for < 35 bec. breast full of glands & not done for lactating women full of milk]

5% of cases are missed

- Criteria for malignancy :-
 - microcalcification (pathognomic) ^{> 5 cluster}
 - irregular margin speculated
 - stellate opacity, architecture distortion
 - parenchymal asymmetry
 - absent fatty layer around tumor
 - thickened skin, dilated veins
 - may be normal.

pathognomic

② Ultrasound :- (differentiate cystic from solid)

- done for pt < 35 yrs.
- cheap, available, safe, non invasive & informative.
- for cystic do ~~aspiration~~ aspiration

- criteria for malignancy
- Bloody fluid.
 - Rapid refilling
 - residual mass
 - +ve cytology

③ Biopsy :- - Excisional biopsy → best, done under G.A. ^{100% accuracy.}

- FNAC → 90% accurate, simple, inexpensive

disadv. :- needs skilled cytology &

doesn't distinguish invasive cancer from ca in situ.

■ Frozen section biopsy.

■ True cut biopsy :- special needle under LA.

disadv. :- false tissue may be taken.

- seeding of ca. to skin
- bleeding

■ Incisional biopsy

④ MRI :- - gold standard for women w/ synthetic prostheses

- distinguish scar from recurrence post op.

NB!: → Benign tumour has a Halo sign in mammograph which is a fatty capsule around tumour.

⑤ invest. for staging (metastasis):-

- Sentinel LN study, $\rightarrow$ inject methylene blue or radioactive isotope $\rightarrow$ follow till LN.
- Lung (CXR), liver (U/S, LFT), Bone (scan Tc^{99}), Brain (CT/MRI)
- Tumour marker CA 15-3 & CEA $\rightarrow$ for follow up prognostic not diagnostic
- Biochemical investigations (Hormonal receptors): about 60% of pt have estrogen Receptor +ve (ER^{+ve})

Triple assessment :-

(Clinical + radiology + biopsy) $\rightarrow$ the +ve predictive value is $>99.9\%$.

- * clinical $\rightarrow$ history (risk factor) & examination.
- * radiological (imaging) $\rightarrow$ mammography, U/S
- * biopsy $\rightarrow$ needle aspiration, True cut biopsy, excist.
(biopsy tissue examined for ER and S-shape friction $\rightarrow$ high S-shape $\rightarrow$ poor prognosis)

"BI-RADS" system in mammogram

- BI-RADS = (Breast Imaging - Reporting And Data System)

include 0 - incomplete.

1 - negative.

2 - benign finding.

3 - probably benign.

4 - suspicious abnormality.

5 - highly suggestive of malignancy.

6 - Known biopsy - proven malignancy.

Screening for breast cancer :-

- all women over 20 yr advised to examine her breasts monthly [BSE = breast self exam.]

- mammographic screening 3 yearly for women aged (50 - 64 years)

"Screening is identifying people with $\uparrow$ ed risk or disease before S/S, or looking for a disease in anormal people

Treatment:

- Stage I & II $\rightarrow$ [operable] while III & IV $\rightarrow$ [Inoperable]

* (A) Operable cases (stage I & II) :-

- Stage I: Tumour excision either: (with follow up)

- Wide local excision: for tumor < 3 cm with post op. radiotherapy to breast [equally effective as mastectomy]

- Mastectomy: for tumor > 3 cm with axillary clearance

- Stage II: Mastectomy (see next) + axillary clearance + Radiotherapy with chemotherapy (if ER -ve) or hormonal (if ER +ve).

* (B) Inoperable cases (stage III & IV) :-

- Stage III: - Radiotherapy (to all LN) with surgery if fungating mass

- Chemotherapy (CMF & Adriamycin) $\rightarrow$ 6 cycles for 6 months

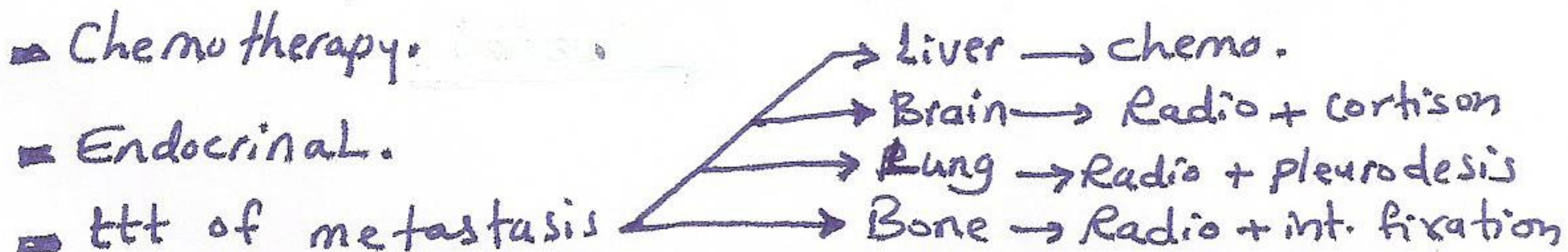
- Endocrinal: (Tamoxifen, ovariectomy, ...) $\rightarrow$ if (ER +ve)

- Stage IV: - Radiotherapy (to painful bony deposits)

- Chemotherapy.

- Endocrinal.

- ttt of metastasis



(NB) $\rightarrow$ There is no survival benefit of mastectomy over lumpectomy plus radiation for stage I & II disease (Toronto)

Prognosis :- Depending on:

- Type of tumor (Cis better than matic's carcinomatous)

- Stage of tumor (I " " IV)

- Site of tumor (lateral " " medial side).

- Age of patient (old " " young $\rightarrow$ bec. of sex hormones)

- Sex of patient (♀ " " cancer ♂).

- hormone receptors (ER +ve " " ER -ve)

- the most imp. prognostic indicator for ttt is axillary node status.

[NB]. gender then sex are the 2 strongest risk factor for Ca. breast (Toronto)

BCS = Breast conservative surgery
include lumpectomy & Quast
- can be done to most women in stage I or II (Toronto)

A* Surgery in Breast Ca.:

① QUART operation:-

QUART = Quadrantectomy + Axillary clearance + Radiotherapy.

- Used for small mass (< 4cm), big breast, young female and well differentiated tumour.

② Radical Mastectomy of "Halsted".

- Removal of :- Elliptical skin (including nipple & areola) with whole breast
 - All axillary LN & fat medial to axillary vein
 - removing 2 pectoralis muscles. if remove mediastinal LN called extended radical

③ Modified Radical mastectomy of "Patey" [used widely]

- Same as Halsted operation but preserve Pectoralis major and either remove Pect. minor (or cut its insertion).
- most commonly used

[NB]. post-op. complications:- are:

- ① haematoma & wound infection
- ② upper limb oedema
- ③ Bridle scar: limitation of abduction.

[NB]. Breast reconstruction by:

- ① silicone prosthesis → best
- ② Myocutaneous flap as rectus abd. or latissimus dorsi flap.

B* Chemotherapy: ↓ - Local

- It is the best curative for premenopause, used in occult metastasis, used as palliative in advanced cases.
- It is indicated in ER -ve, using CMF & adriamycin
(CMF = cyclophosphamide, Methotrexate & Fluorouracil).

↳ may cause - bladder cancer, leukemia
- B.M suppression
6 month cycles

C* Hormonal:

- It is the 1st line Rx in post menopausal pt
- used in ER +ve female.
- Tamoxifen (antioestrogen) given 20 mg/day in pre & post menopausal.
Response → complete response in 20-30%.
• ↓ risk of contralateral breast ca. by 40%.

* Follow ttt of breast cancer :-

• Receptors of breast :-

1. Estrogen - progesterone receptor (ER) :-
(herceptin receptor).
2. HER2 receptor :- Human Epidermal growth factor 2.

NB :- **ER** → if +ve → can give hormonal ttt

- Tamoxifen :- block estrogen receptor
- Non-steroidal aromatase inhibitor :- stop estrogen synthesis in adipose tissue

• **HER2** → if +ve → can give immunotherapy.

- Herceptin :- block HER2 receptor → prevent cell cancer division
(Trastuzumab)

• Tamoxifen :- MOA → block ER.

- S/E → DVT (not given for postmenopause)
- route → orally (1 tablet/day for 5 years).

• Anastrozole

• Exemestane

• Letrozole

→ (selective aromatase inhibitor)

- MOA → block or inhibit estrogen production in adipose tissue in adrenal gland.
- route → orally (1 tab./day for 5 days).

• Goserelin

• Buserelin

• Leuprolide

→ LHRH analogue ^{reversible drug} (luteinizing hormone releasing hormone)

- MOA → induction of menopause.
- use → in ♀ endometriosis, ♂ prostate ca.
- route → s/c per month or per 3 months

• Herceptin (Trastuzumab) :-

- MOA → block HER2 receptor → kill cancer division
- it is not 1st line of ttt.

NB • Before start ttt of cancer do staging.

• Look for metastasis in Bone, lung, liver.

• CBC (anemia if bone marrow infiltrated), LFT
tumour marker (base line not for staging but follow up) → CA 15-3, CEA.

• see if axillary LN involved by clinical exam, and biopsy (guided u/s) or fine needle.

* Result of staging ::

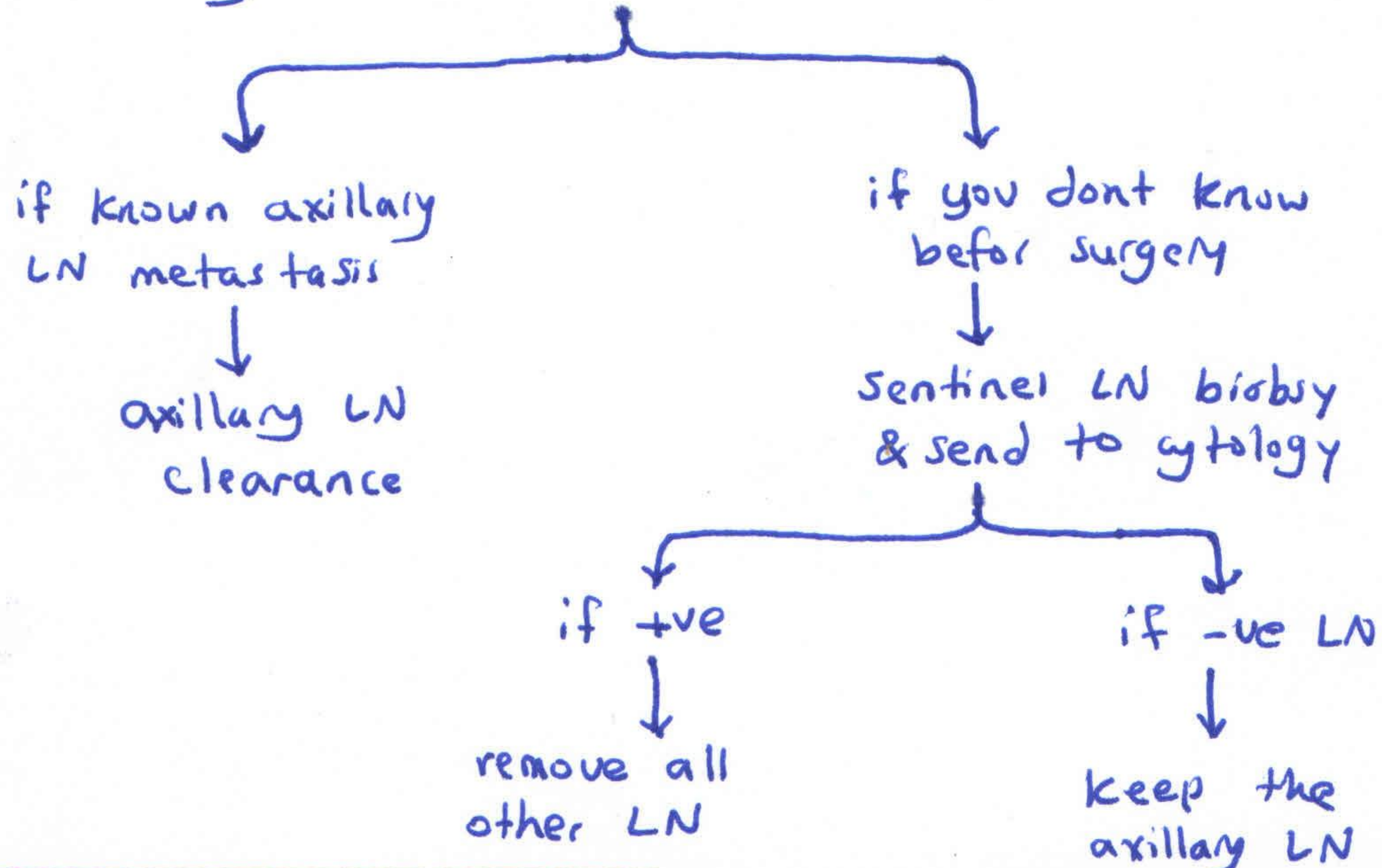
- ① Early breast cancer (small tumor, cancer limited in breast or small axill. → no metast Mo)
- ② Locally advanced disease (large tumour + Mo).
- ③ Metastatic cancer.

① early breast cancer

- Surgery either ① simple mastectomy.

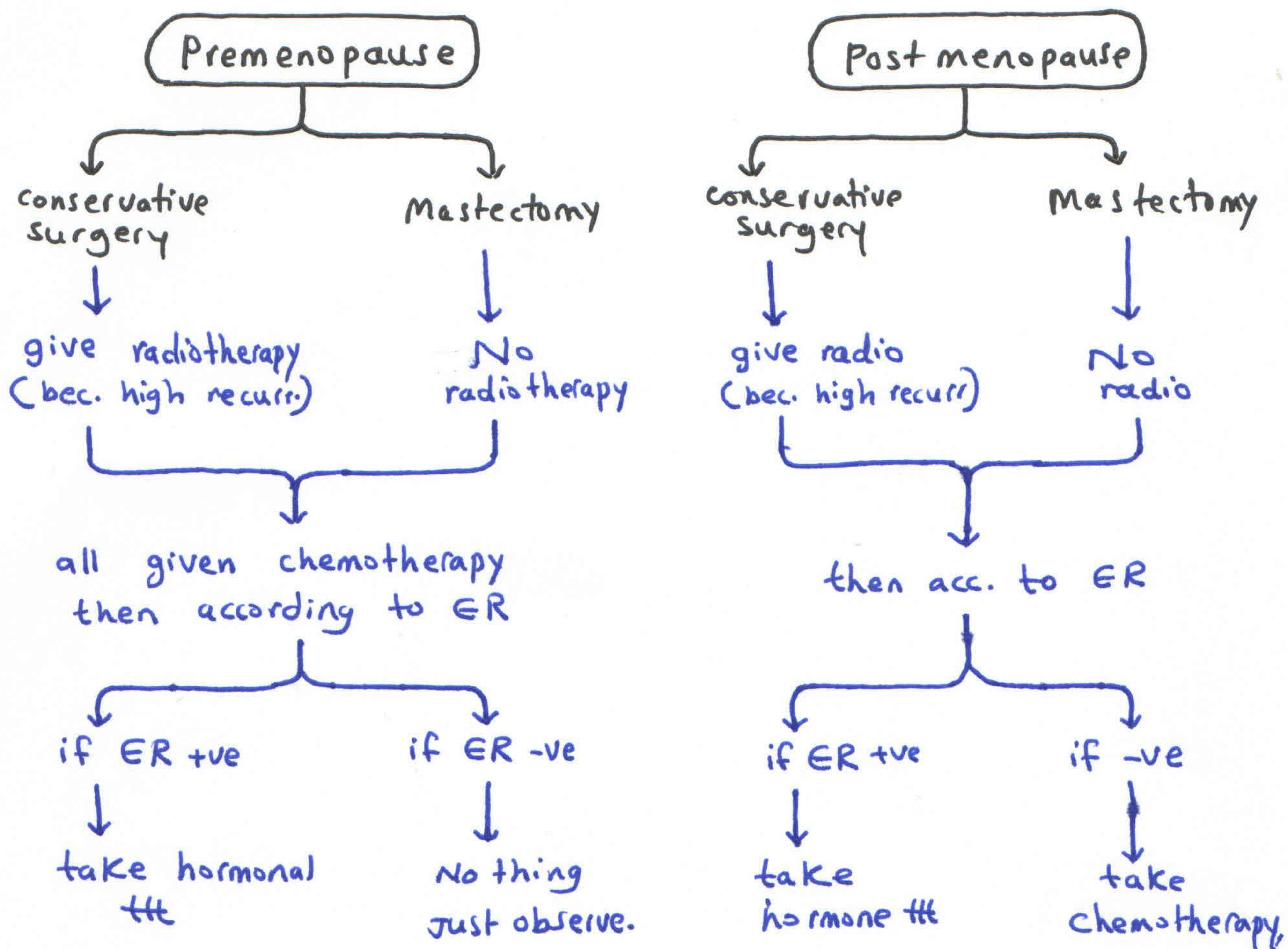
② conservative surgery → lumpectomy
Quadrantectomy
wide local excision.

- if axillary breast cancer



NB:- sentinel LN → is 1st LN w receiving tumour spread.

- After surgery the next step depends on pt age (pre or postmenopause) & type of surgery (conservative or mastectomy).



II Locally advanced disease (large or ulcerating).

- before doing surgery send pt to neoadjuvant chemotherapy or hormonal therapy (3 doses chemo)
- NB:- Neoadj → administration of therapeutic agent before a main tmt.
- target to ↓ size of tumour before surgery.

III Metastatic ca.

- before surgery send to neoadj. chemor (for more duration than locally advanced tumor)
- then come for surgery or palliative

• Congenital nipple retraction:- Fixed [if not resolved in puberty or pregnancy] by mechanical suction devices or frequent digital drawing.

- Ashford's operation [purse string around nipple]



* Congenital anomalies

ANATOMY

* Description:

• Congenital nipple retraction:- Fixed [if not resolved in puberty or pregnancy] by mechanical suction devices or frequent digital drawing.

- Ashford's operation [purse string around nipple]



* Congenital anomalies

ANATOMY

* Description:

V. FIBROCYSTIC DIS. OF BREAST : ANDI

- Palpable LV in fibroadenosis are due to chemical irritation by abnormal hyper-secretions from the hyperplastic epithelium.

2. Cyst formation: Degeneration or retention cyst.
- retention cyst (Cyst of blood) is due to retention of blood.
- Cyst formation: Degeneration or retention cyst.

3. Clinical picture: May be a giant cyst.
- After a few days or weeks, the cysts may become very large and may cause pain.

4. Discharge: - Green or dark brown or bloody.
- Mass: Painful & fixed to breast tissue, away from the areola.

5. Discharge: - Tender, firm mass (or firm nodules) (or firm lumps) in the breast.
- Discharge: - Green or dark brown or bloody.

6. Discharge: - Green or dark brown or bloody.
- Mass: Painful & fixed to breast tissue, away from the areola.

7. Discharge: - Green or dark brown or bloody.
- Mass: Painful & fixed to breast tissue, away from the areola.

8. Discharge: - Green or dark brown or bloody.
- Mass: Painful & fixed to breast tissue, away from the areola.

9. Discharge: - Green or dark brown or bloody.
- Mass: Painful & fixed to breast tissue, away from the areola.

the same as the one in the
last paragraph.

Radical Mastectomy

① Quarta operation

- In Halsted: preserve axillary vessels, cephalic vein, N. to serratus ant. & N. to latiss dorsi

② Radical Mastectomy of "Halsted"

- Removal of: - Clipped skin (2 cm x 2 cm) with whole breast
- All axillary LN & fat medial to axillary vein
- Removing 2 pectoralis muscles
- Preserve and "latiss" (used widely)
- Same as Halsted operation but preserve pectoralis major
- and either remove lat major (or cut its insertion)
- most commonly used

④ Post-op. complications:

① Infection & wound infection

② Brille scarification of axilla

⑤ Breast reconstruction:

① Silicone prostheses + fat

② Myocutaneous flap or rectus abdominis or latiss flap

B + Chemotherapy

- It is the best outcome for breast cancer, used for
- soft reduction, used as palliative in advanced cases
- It is indicated in ER+, using CMF & endocrine
- (CMF = cyclophosphamide, methotrexate & 5-FU)

The Hormonal

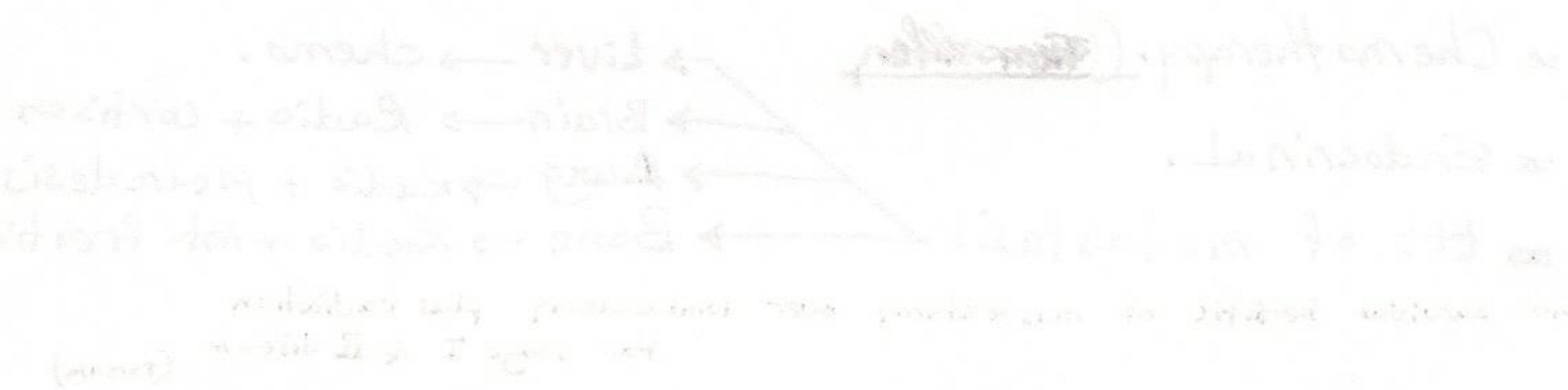
- It is the 1st line & is post-menopausal
- used in ER+ female
- Tamoxifen (antiestrogen) given to ER+ breast cancer
- Response to tamoxifen response 30-50%
- Effect of tamoxifen best in ER+ breast cancer

- for tumor > 3 cm or centrally located or multifocal tumor.

Stage II: Mastectomy (lumpectomy + axillary clearance + radiotherapy)
with chemotherapy (if ER -ve) or hormonal (if ER +ve).

Stage III & IV:
- Stage III: mastectomy (or all LN) with axillary clearance + radiotherapy + chemotherapy (if ER -ve) or hormonal (if ER +ve) for 6 months.

Stage IV: - radiotherapy (to painful bony deposits)
- Endocrine: (tamoxifen, goserelin, etc.) - if (ER +ve)
- Chemotherapy (cyclophosphamide) - 6 cycles for 6 months.



Prognosis

- Type of tumor (co ductal carcinoma)
- Stage of tumor (I - IV)
- Size of tumor (tumor)
- Type of patient (ER +ve / ER -ve)
- Age of patient (ER +ve / ER -ve)
- Hormone receptors (ER +ve / ER -ve)
- The most important prognostic factor for ER +ve patients is the status of the hormone receptors.

V. FIBROCYSTIC DIS. OF BREAST : ANDI

- Palpable LN in fibroadenosis are due to chemical irritation by abnormal hyper-secretions from the hyperplastic epithelium.

the axillary vessels are preserved

① QUART operation

• In Halsted: preserve axillary vessels, cephalic vein, N. to serratus ant. & N. to latiss dorsi

② Radical Mastectomy of "Halsted"

- Removal of - Clipped skin (cephalic & axillary) with whole breast
- All axillary LN & fat medial to axillary vein
- removing 2 pectoralis muscles
- preserve and "latiss" (used widely)
- Same as Halsted operation but preserve pectoralis major and minor (not other) (on its insertion)
- most commonly used

④ Post-op. complications:

- ① Infection & wound infection
- ② Brille scarification of axilla

③ Breast reconstruction:

- ① Silicone prostheses - best
- ② Myocutaneous flap or rectus abdominis or latissimus dorsi flap

B + Chemotherapy: 1- local

- It is the best against the lymphatic system, used for soft metastases, used as palliative in advanced cases
- It is indicated in ER, using CMF (cyclophosphamide, methotrexate & 5-Fluorouracil)

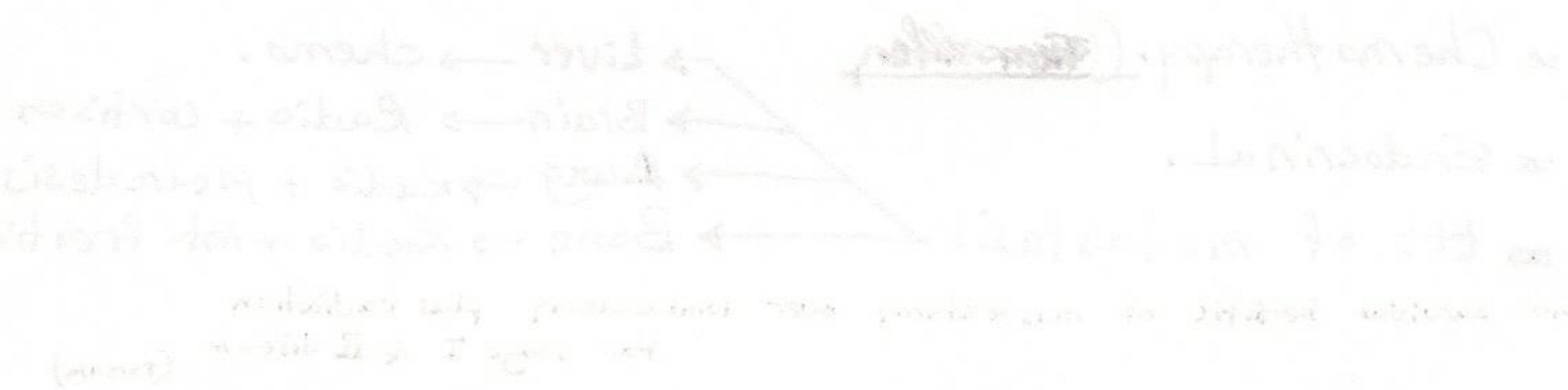
The Hormonal:

- It is the 1st line & is post-menopausal
- used in ER in female
- Tamoxifen (antiestrogen) given to ER+ tumours for & post-menopausal
- Response - 50% to 60% response rate
- 1st line of treatment for ER+ breast cancer

- for tumor > 3 cm or centrally located or multifocal tumor.

Stage II: Mastectomy (lumpectomy + axillary clearance + radiotherapy)
with chemotherapy (if ER -ve) or hormonal (if ER +ve).

Stage III & IV:
- Stage III: mastectomy (or all LN) with axillary clearance + radiotherapy + chemotherapy (or 6 cycles for 6 months)
- Stage IV: radiotherapy (to painful bony deposits)



Prognosis

- Type of tumor (co better than single metastasis)
- Size of tumor (I - IV)
- Site of tumor (local, regional, distant)
- Age of patient (all)
- Sex of patient (ER -ve)
- Hormone receptors (ER +ve, ER -ve)
- The most important prognostic factor for ER +ve breast cancer is the status of the hormone receptors.